

SURVIVAL OF ELEVEN ALFALFA POPULATIONS IN SEMIARID RANGELAND

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ABSTRACT

Inclusion of alfalfa (*Medicago sativa* L.) in grasslands to increase forage production and quality has long been valued. However, persistence of alfalfa in semiarid rangeland has generally been poor when traditional hay-type cultivars adapted to mesic environments are used. Demand exists for alfalfa that can establish and persist in semiarid rangeland. One wild population of predominantly yellow-flowered alfalfa (YFA) (*Medicago sativa* subsp. *falcata*) was found growing and reproducing naturally in the Grand River National Grassland in northwestern South Dakota. YFA therefore demonstrates persistence in this semiarid environment. We initiated a study in May 2006 at the Antelope Research Station in northwestern SD to evaluate persistence and vigor of eleven alfalfa populations transplanted into mixed-grass prairie. Populations consisted of four naturally selected rangeland populations (locally adapted, predominantly YFA), two pure YFA populations, two pasture-type cultivars, and three conventional hay-type cultivars. Seedlings were space planted on 1 m-centers within three exclosures (35 m X 35 m) divided into two sections; one exposed to grazing, the other protected from grazing. Cattle grazing was initiated in August 2007. During the 2008 growing season, intense grazing of alfalfa plants and associated vegetation occurred monthly for one day. Survival data from this season revealed that locally adapted populations with a high percentage of YFA background had the highest survival ($\approx 70\%$). Pasture-type cultivars were intermediate in survival ($\approx 57\%$) while conventional hay-type cultivars were lowest ($\approx 45\%$). These findings reveal that locally adapted alfalfa populations are persistent and have great potential for being utilized in semiarid grasslands.